



Radionuclide Aerosol Sampler/Analyzer

Near Real Time, Automated, Unattended

DESCRIPTION

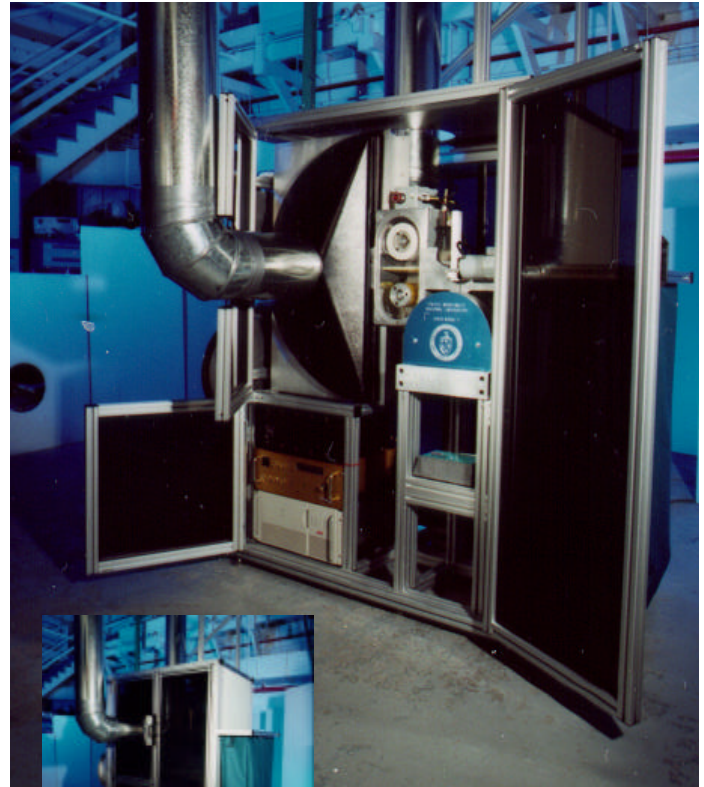
The Radionuclide Aerosol Sampler Analyzer (RASA) Mark 4 is an automatic, high-volume system for sampling and analyzing the atmosphere for radioactive debris indicative of nuclear weapons testing. The RASA fills the Comprehensive Test Ban Treaty (CTBT) requirement for near-real-time ultra-sensitive field measurement of short-lived fission products. This permits detection at great distances from nuclear detonation sites. The analyzer passes air through a large-area, low-pressure-drop filter at a high flow rate for selectable time periods; then seals, bar codes, and performs a gamma-ray analysis of the filter. The gamma-ray spectrum and auxiliary data are automatically transmitted to designated data centers. Filter samples are retained for subsequent analysis.

SYSTEM SPECIFICATIONS

- Continuously separates aerosol radionuclides from the atmosphere at a flow rate of 15,000-20,000 m³/day.
- Measures the concentrations of several aerosol radionuclides including ⁹⁹Mo, ¹⁴⁰Ba with a sensitivity of about 30 µBq/m³ of air.
- Auto-transmits gamma-ray spectra and auxiliary data to designated data centers.
- Employs a large, mechanically-cooled germanium gamma-ray spectrometer.
- Requires 1.6 kW of power, is less than 1 x 2 x 1 m in size, and is below 75dBA at 1 m.
- Runs 200 samples (typically 1 per day) between restocking visits at a cost of about \$6 per sample.

ADVANTAGES OF AUTOMATED NEAR REAL-TIME ANALYSIS

- Makes continuous measurements without assistance by operators.
- Eliminates delays and human errors in manual sample collection and analysis.
- Permits timely reporting of any abnormally high concentrations of radionuclides.
- Provides cost savings by eliminating daily sample transport and laboratory analyses.



RASA Mark 4 CTBT Particulate Sampler Pre-production Prototype provided to manufacturer

DEVELOPMENT SCHEDULE

- May 1995-February 1996: Extended Field Test of Mark 3 at McClellan Air Force Base.
- February-October 1996: Design of Mark 4.
- November 1996: Mark 4 Testing at PNNL.
- April 1997: Deliver pre-production prototype to selected manufacturer.

COMMERCIAL AVAILABILITY

- November-December 1996: Response period for US Air Force Material Command Request for Proposal.
- April 1997: Manufacturer selected.
- Early 1998: First commercial units available.